# GRAPHICS CODE GENERATOR

BY: SOFTWARE CAROUSEL



Congratulations on your decision to purchase the GRAPHICS CODE GENERATOR by Software Carousel. Proper use of this software utility can save you many hours of programming time. Although the program is menu-driven, we highly recommend that you read these easy-to-follow instructions in their entirety before using your GRAPHICS CODE GENERATOR for the first time.

This software package is designed for use with the TI-99/4 or TI-99/4A Computers. The following peripherals are needed to operate this program:

1) TI Extended Basic Command Module
2) Joystick with Fire Button
3) Cassette Recorder or Disk Drive & Controller
4) TI 99/4 Impact Printer or Epson MX-80 Printer - optional

## OVERVIEW

Aside from animation, sprite graphics, as provided in TI's Extended Basic, enables its users to produce graphics with up to 300 percent the realism that is available when using TI Basic. This can be accomplished by displaying an image and up to four sprites as overlays all on the same screen position, enabling you to have up to six colors apparent in a single character position. GRAPHICS CODE GENERATOR, (GCG), reduces the efforts required when defining special characters, but is especially helpful when working with sprite overlays. Following is a brief description of what GCG can do for you:

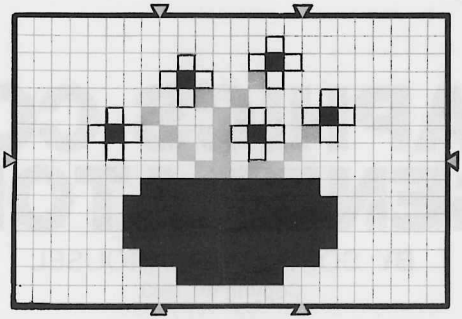
1) Draw your main image and all overlays as one multicolored image;
2) Will automatically calculate and display the appropriate hexcodes;
3) Lets you design graphics (up to 6 characters and 5 colors) using your joystick and fire button;
4) Displays image in its actual size;
5) Relocates images within the display;
6) Rotates images in 90 degree increments;
7) Allows you to change colors of your images;
8) Allows you to save your images on for use in your programs;
9) Allows you to load previously saved images and modify or superimpose them onto other images;
10) Prints a listing of the color codes and hexcodes of your images.

## LOADING INSTRUCTIONS

**CASSETTE:** Rewind cassette to beginning of tape and enter OLD CS1. Follow recording instructions. After "Data Okay" message is displayed, enter RUN. (If "ERROR DETECTED IN DATA" is displayed, adjust cassette recorder volume down. If "ERROR-NO DATA FOUND" is displayed, adjust volume up.)

**DISKETTE:** Load disk in Drive #1, enter OLD DSK1.GCG and enter RUN when ready.

After a few seconds, a display will appear on your screen containing 384 boxes (24 across, 16 down). The center box contains a blinking cursor. The display is divided by arrows representing the beginning and ending points of each of the 6 character locations within the display. Each character location contains 64 squares representing pixels (8 across by 8 down). See diagram on next page:



1. CHANGE OVERLAY #
2. DISPLAY ACTION MENU

**TO DRAW MAIN IMAGE:** Only joystick #1 will function with this program. To begin creating your first image, simply press the fire button while moving the joystick. (Be sure the alpha lock key is not depressed.) The first image will always appear in black, however, this can be changed with the change color feature in the Action Menu.

**TO DRAW SPRITE OVERLAYS:** After you have drawn your main image, press key #1 (do not press enter). The words "ENTER OVERLAY #" will appear on the screen. Press key #2 and enter. When "ENTER COLOR CODE" appears, enter a valid color code from #2 to #16. You will now be drawing in the color code you have chosen for your second overlay. These steps can be repeated for up to 5 overlays.

Since it requires 2 sprites per overlay to redisplay the 6 character grid within your program, and since Extended Basic only permits 4 sprites to be displayed on a single row simultaneously, you should limit your image to 4 character positions when using a main image with more than 2 sprite overlays. All 6 character positions can be used with a main image and up to 2 overlays.

If you wish to return to a previous overlay to make a correction or addition, simply press key #1 to change the overlay number and then enter the overlay # that you wish to return to.

**TO ERASE:** To erase part of an image, change the overlay # to 0 and enter. Move the cursor to the square you want erased and depress the fire button.

**ACTION MENU**

| | |
|---|---|
| 1. CODE IMAGE | 6. CLEAR SCRN |
| 2. DISPLAY IMAGE | 7. SAVE/LOAD |
| 3. ROTATE IMAGE | 8. PRINT |
| 4. RELOCATE IMAGE | 9. END PRGM |
| 5. CHANGE COLOR | 10. MENU #1 |

The enter key must be depressed after each selection is input. A counter is displayed for the options that take more than 10 seconds for calculations:

1. **CODE IMAGE:** This option calculates the appropriate hexcodes for the image and overlays you have drawn. It takes approximately 20 seconds per overlay to complete the necessary calculations. When ready, "ENTER OVERLAY #" will display on the lower portion of your screen. Entering numbers 1 through 5 will display the appropriate hexcodes for each overlay selected. To return to the Action Menu, #9 must be entered.

2. **DISPLAY IMAGE:** The grid on which you have created your image is 64 times the actual size of the specially defined characters that will be displayed in your program. The Display Image option allows you to view the main image or overlays in their actual size. When "ENTER OVERLAY #" is displayed, should enter 1,2,3,4 or 5 to view the appropriate overlay. #9 must be entered to return to the Action Menu.

> **Note:** If your hexcodes have already been calculated with option #1, then the Display Option will begin within 5 seconds; however, if yor images have not been coded yet, the display option will automatically initiate the hexcode calculations.

3. **ROTATE IMAGE:** There are many occasions when it it necessary to calculate hexcodes for the same image aiming in different directions. An example of this are the arrows used to separate character portions in this program's display. The ROTATE feature provided permits you to create the image once, calculate the hexcodes, then rotate it and again calculate the hexcodes for any 90 degree angle required. Since we are dealing with a rectangular screen format, it becomes impossible to rotate the full 6 character grid within the screen; therefore, only the 4 lefthand characters will rotate when this option is exercised. Any drawing within the upper or lower righthand character portions will be lost with the use of this command. When the ROTATE option is exercised, the 4 character portions on the left side will be rotated in a counter-clockwise direction in about 30 seconds.

4. **RELOCATE IMAGE:** This option can be very helpful when defining animated graphics. After creating an image, you can shift it to any position within the screen display and recalculate the hexcodes. Since this can be done repeatedly, it enables you to reproduce the same image in a multiple of positions, making animation simple. The RELOCATE feature can also come in handy if you find yourself short of space to complete one side of your image. It is not necessary to calculate hexcodes prior to relocating an image unless you need those hexcodes for your program. After selecting option #4, "ENTER # OF COLS." will be displayed in the lower portion of your screen. To move your image to the right, Enter a positive number from 1 to 24 representing the number of columns to the right that you wish to move your image (a "+" sign need not be entered). Likewise, to move the image to the left, a negative number should be entered (a "-" sign is required preceding the number). "ENTER # OF ROWS" will now be displayed. A positive number will lower your image while a negative number will raise it.

> **Note:** Any portion of your image or drawing that is relocated off the screen will be lost.

5. **CHANGE COLOR:** This option permits you to change a previously selected color for either your main image or any of its overlays. After entering the overlay # that you wish to change, "ENTER COLOR #" will appear. By entering the new color code number, you will immediately change the color of that overlay on the display and will be automatically returned to the Action Menu.

6. **CLEAR SCREEN:** When selected, this option clears your screen and resets the variables in the program enabling you to start a new drawing.

7. **SAVE/LOAD:** This option enables you to save the hexcodes and color codes for future use in your program or to load them into the GRAPHICS CODE GENERATOR for future modifications or superimposing. Utilizing the SAVE feature, you can create an entire file of miscellaneous special characters for random use in many different programs. When the "SAVE OR LOAD" question is displayed, enter "S" OR "L" (be sure the alpha lock key is depressed). When "TAPE OR DISK" displays, enter "T" or "D". If a disk response is given, "ENTER FILE NAME" will appear at the lower part of your screen. Your data will be stored on Drive #1 within the file name that you input. If LOAD is selected while and image already exists on your screen, then "SUPERIMPOSE OR CLEAR" will be displayed on the screen. If you enter "S" then the image being loaded will be superimposed over the current image on the grid. If "C" is entered, the current image on your screen will be erased prior to loading the file.

8. **PRINT:** The PRINT feature was designed to work in conjunction with the TI-99/4 Impact Printer or Epson MX-80 Printer. When selected, you will be asked to enter the name of your image and the print device. Any image name entered will be printed on the top of the hexcode listing. Your response to the print device prompt should be formatted in the same manner as you would for the second portion of a list command. Example: RS232 or RS232/1.BA=9600.EC.CH

> **Note:** Be sure the alpha lock key is depressed when entering print device. Do not use quotation marks.

9. **END PROGRAM:** Entering #9 while in the Action Menu mode will end your program and nullify all variables.

10. **MENU #1:** Returns you to the draw mode. You are able to draw whenever the cursor is blinking.

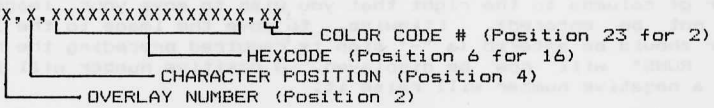
## AUTO EXTRACTION OF HEXCODES

Upon completing an image with GCG, you can manually input the hexcodes into your program or you have the option to save your image on tape or disk and then have your program read the hexcodes directly from those files. Although the use of this option will eliminate the need for you to manually transfer a multitude of hexcodes into your program, it will cause your program to start up quite slowly due to file manipulations. If you intend to use your program repeatedly, it is suggested that the hexcodes be directly defined within your program. If you choose to extract the hexcodes automatically then it will be necessary to design and incorporate a subroutine into your program that will:

1. Open the appropriate image file;
2. Read the records into your program using "INPUT";
3. Segment the records into fields with "SEG$";
4. Assign character numbers with "CALL CHAR";
5. Define colors for character groups with "CALL COLOR";
6. Display images with "CALL HCHAR" or "CALL SPRITE".

The coding for these steps will vary from program to program depending upon how many files are to be opened and how many overlays and sprites are to be used.

The record layout used by GCG when saving an image is:




The sample subroutine which follows was designed to display a 6 character main image with 2 overlays in the center of the screen.

```
100 CALL CLEAR :: CH=39 :: DIM R$(18)
110 FOR I=40 TO 69 :: CALL CHAR(I,""):: NEXT I
120 OPEN #1:"DSK1.FILENAME" :: FOR I=1 TO 18 :: INPUT #1:R$(I):: IF R$(I)="END"
THEN 140
130 NEXT I
140 CLOSE #1 :: REM **** ASSIGN CHARACTER NUMBERS ****
150 FOR I=1 TO 6 :: CALL CHAR(33+I,SEG$(R$(I),6,16)):: NEXT I
160 FOR I=7 TO 18 :: CH=CH+1 :: CT=CT+1 :: CALL CHAR(CH,SEG$(R$(I),6,16)):: IF
CT=4 THEN CH=CH+4 :: CT=0
170 IF VAL(SEG$(R$(I),4,1))>5 THEN CH=CH+6 :: CT=0
180 NEXT I
190 REM **** DISPLAY MAIN IMAGE ****
200 CALL COLOR(1,VAL(SEG$(R$(1),23,2)),8)
210 CALL HCHAR(11,16,34):: CALL HCHAR(12,16,35):: CALL HCHAR(11,17,36):: CALL
HCHAR(12,17,37):: CALL HCHAR(11,18,38):: CALL HCHAR(12,18,39)
220 REM **** DISPLAY SPRITES ****
230 CALL MAGNIFY(3):: FOR I=1 TO 2
240 CALL SPRITE(#I,(24+(16*I)),VAL(SEG$(R$(1+(6*I)),23,2)),81,121):: CALL
SPRITE(#(I+4),(32+(16*I)),VAL(SEG$(R$(1+(6*I)),23,2)),81,137)
250 NEXT I
260 GOTO 260
```

## COPYRIGHT AND WARRANTY INFORMATION

The Graphics Code Generator and documentation are copyrighted. Illegal copying of this program is an infringement and we will not hesitate to prosecute anyone who violates this copyright. A backup copy of Graphics Code Generator has been provided on the reverse side of the cassette and on the diskette (DSK1.GCGBKUP). If this program refuses to load due to a manufacturing defect, we will replace it for you. Just return the cassette or diskette to us and we will ship a replacement immediately. In no event shall Software Carousel or any of its owners be liable to anyone for any damages in connection with or arising out of the purchase or use of this program and regardless of the form of action, the sole and exclusive liability of Software Carousel or any of its owners shall not exceed the purchase price of this program.

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